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Foraminifera from the Chalk of the Gipping Valley, Ipswich

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Foraminifera from the Chalk of the Gipping Valley, Ipswich

Ian P Wilikinson

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Parent Body

Natural Environment Research Council, Polaris House, North Star Avenue, Swindon, Wiltshire SN2 1EU

☎ 01793-411500 Fax 01793-411501
www.nerc.ac.uk

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Summary

The faunas recorded from the Chalk of the Ipswich sheet are predominantly of BGS19 foraminifera zone (*pilula* to very basal *quadrata* macrofaunal Zone). A few samples contained longer ranging taxa which prevented accurate age determinations, although all fell within the *socialis* to basal quadrata zones. The occurrence of *Pullenia* cf. *quaternaria* appears to be outside its stratigraphical limits compared to southern England, but careful examination of this foraminifer indicates that it is a new species and that interpretation of some other records in eastern England may deserve reconsideration.

1 Introduction

A suite of samples from the Ipswich sheet (50K sheet 207) were examined for microfaunas in order to provide biostratigraphical age determinations for the Chalk of the Gipping Valley. Foraminifera were common in the majority of samples and their distribution forms basis for the present conclusions. Ostracoda were also present throughout, but as their distribution is unknown in detail, they have not been used herein.

2 Biostratigraphical conclusions

Selected stratigraphically important species are included herein. Complete species lists are held on the palaeontological logging sheets held on file.

2.1 MPA 52661 WMD9436

Gavelinella stelligera
Heterohelix striata
Rugoglobigerina pilula
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: Stratigraphically no lower than the *anglicus* Zone (BGS 18iv) and no higher than the *pilula* Zone (BGS19). *Gavelinella cristata* was not observed. *Inoceramus* prisms present.

2.2 MPA 522662 WMD9437

Bolivinoides culverensis
Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Neoflabellina rugosa
Pullenia cf *quaternaria*
Stensioeina granulata incondita
Stensioeina pommerana
Conclusions: Stratigraphically no lower than the *pilula* Zone (BGS19) and probably no lower than the upper part of the zone. Stratigraphically no higher than the very basal part of the *quadrata* zone, i.e. the top of BGS19 (in southern England *G cristata* becomes extinct close to the Arundel Sponge Bed and lateral equivalents).

2.3 MPA 52663 WMD9438

Eouvigerina gracilis
Gavelinella cristata
Gavelinella stelligera
Globotruncana arca
Stensioeina granulata granulata
Conclusions: The fauna is restricted to BGS19, pilula to very basal quadrata zone, based on the inception of *G. arca* and *G. cristata*. Abundant Inoceramus prisms and ostracods occur.

2.4 MPA 52664 WMD9439

Gavelinella cristata
Gavelinella stelligera
Gavelinella thalmanni
Heterohelix striata
Reussella kelleri
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: The fauna from this buff coloured chalk is restricted to BGS 18ii (mid *socialis* Zone) to BGS19, *pilula* to very basal *quadrata* zone. Inoceramus prisms are common.

2.5 MPA 52665 WMD9440

Bolivinoides culverensis
Gavelinella stelligera
Heterohelix striata
Rugoglobigerina pilula
Stensioeina granulata granulata
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: Based on the concurrent range of *B. culverensis* and *S. g. perfecta*, the fauna is placed into BGS19, *pilula* to very basal *quadrata* zone. Inoceramus prisms are abundant.

2.6 MPA 52666 WMD9441

Bolivinoides culverensis
Gavelinella stelligera
Heterohelix striata
Neoflabellina rugosa
Rugoglobigerina pilula
Stensioeina granulata granulata
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: Foraminiferal preservation is generally poor. Based on the concurrent range of *B. culverensis, N. rugosa* and *S. g. perfecta*, the fauna is placed into BGS19, *pilula* to very basal *quadrata* zone. Inoceramus prisms are abundant.

2.7 MPA 52667 WMD9442

Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Neoflabellina rugosa
Reussella szajnochae praecursor
Stensioeina granulata granulata
Stensioeina pommerana
Conclusions: The fauna from this buff to dark cream chalk is restricted to BGS19, *pilula* to very basal *quadrata* zone (and probably in the upper part of that range on the basis of the presence of *S. pommerana*). Ostracods are common.

2.8 MPA 52668 WMD9443

Bolivinoides culverensis

Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Reussella kelleri
Reussella szajnochae praecursor
Stensioeina granulata granulata
Stensioeina granulata perfecta
Conclusions: The fauna is restricted to BGS19, *pilula* to very basal *quadrata* zone, the concurrent range of *B. culverensis, G. cristata* and *S. g. perfecta*. Inoceramus prisms are common.

2.9 MPA 52669 WMD9444

Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Neoflabellina rugosa
Reussella kelleri
Stensioeina cf *pommerana*
Stensioeina granulata incondita
Conclusions: The fauna is restricted to BGS19, *pilula* to very basal *quadrata* Zone. The presence of *N. rugosa* places the fauna no older than the pilula Zone. Inoceramus prisms are common.

2.10 MPA 52670 WMD9445

Gavelinella cristata
Gavelinella stelligera
Stensioeina granulata granulata
Stensioeina granulata perfecta
Conclusions: Foraminifera are poorly preserved and fairly rare. Only longer ranging species were present. BGS18ii (socialis Zone) to BGS 19 are suggested, based on the presence of *S. g. perfecta. Inoceramus* prisms are common.

2.11 MPA 52671 WMD9446

Bolivinoides culverensis
Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Neoflabellina rugosa
Pullenia cf *quaternaria*
Rugoglobigerina pilula
Stensioeina exsculpta exsculpta
Stensioeina granulata granulata
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: The fauna is restricted to BGS19, *pilula* to very basal *quadrata* zone. This is based on the inception of *B. culverensis* and *N. rugosa* together with the extinction of *G. cristata* and *S. g. perfecta.*

2.12 MPA 52672 WMD9447

Gavelinella cristata
Gavelinella stelligera
Conclusions: A very small fauna comprising long ranging species was recorded in this buff coloured chalk. Foraminifera are rare. The presence of *G cristata* places the fauna within BGS18 or BGS 19 (highest *coranguinum* Zone to lowermost *quadrata* Zone).

2.13 MPA 52673 WMD9448

Gavelinella cristata
Gavelinella stelligera
Gavelinella thalmanni
Heterohelix striata
Reussella szajnochae praecursor
Stensioeina granulata granulata
Stensioeina granulata incondita
Stensioeina granulata perfecta
Stensioeina pommerana
Conclusions: The inception of true *S. pommerana* and extinction of *G. cristata* and *S. g. perfecta* suggests a position within the upper part of BGS19 (*pilula* or very basal *quadrata* zones). Inoceramus prisms are frequent.

2.14 MPA 52674 WMD9449

Bolivinoides culverensis
Bolivinoides strigillatus
Eouvigerina gracilis
Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Neoflabellina rugosa
Reussella szajnochae praecursor
Stensioeina cf *pommerana*
Stensioeina granulata perfecta
Conclusions: The concurrent range of the two species of *Bolivinoides* places the assemblage into BGS, the *pilula* Zone or very basal quadrata Zone. The inception of *N. rugosa* and extinction of *S. g. perfecta* and *E. gracilis* also proves BGS19. Inoceramus prisms are common.

2.15 MPA 52675 WMD9450

Bolivinoides culverensis
Gavelinella stelligera
Pullenia cf *quaternaria*
Reussella kelleri
Rugoglobigerina pilula
Stensioeina pommerana
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: The concurrent range of B. culverensis, R, kelleri and S. g. perfect places the fauna in BGS19 (*pilula* Zone to very basal *quadrata* Zone). The presence of *S pommerana* suggests the upper part of the zone.

2.16 MPA 52676 WMD9451

Gavelinella cristata
Gavelinella thalmanni
Heterohelix striata
Reussella szajnochae praecursor
Stensioeina exsculpta exsculpta
Stensioeina granulata granulata
Stensioeina granulata incondita
Stensioeina granulata perfecta
Conclusions: BGS18ii to the basal part of BGS19 is indicated by the presence of *S. g. perfecta* and *S. e. exsculpta* (mid *socialis* to basal *pilula* zones). Inoceramus prisms are present.

2.17 MPA 52870 WMD9457

Bolivinoides culverensis
Gavelinella cristata
Gavelinella stelligera
Heterohelix striata
Stensioeina granulata granulata
Stensioeina pommerana
Conclusions: The presence of G. cristata and B. culverensis proves foraminiferal zone BGS19. Stensioeina pommerana suggests the assemblage is from the upper part of the zone. This corresponds to the pilula to very basal quadrata macrofaunal zones.

2.18 MPA 52871 WMD9458

Gavelinella cristata

Gavelinella stelligera

Neoflabellina rugosa

Stensioeina exsculpta exsculpta

Conclusions: The listed species prove the basal part of BGS19 (lowest *pilula* macrofaunal Zone)

2.19 MPA 52872 WMD9459

Gavelinella cristata

Gavelinella stelligera

Heterohelix striata

Stensioeina pommerana

Conclusions: *Gavelinella cristata* and *Stensioeina pommerana* have a concurrent rang of late BGS19 (upper part of the *pilula* zone.

2.20 MPA 52873 WMD9460

Gavelinella cristata

Neoflabellina rugosa

Stensioeina pommerana

Conclusions: The species listed have a concurrent rang of late BGS19 (upper part of the *pilula* zone.

3 Taxonomic note

The presence of *Pullenia* cf. *quaternaria* in samples MPA 522662 (WMD9437), MPA 522671 (WMD9446) and MPA 522675 (WMD9450) needs explanation. *Pullenia quaternaria* first evolved at an important bioevent at the base of BGS20iii (in the upper part of the *quadrata* Zone) in southern England. Its first appearance is at the Whitecliff Marl in Sussex and the Isle of Wight and has been used as a biostratigraphical index by a number of authors. Its apparent occurrence with markers for BGS19 (*pilula* to basal *quadrata* zones) in the Ipswich area, poses a conundrum.

Having examined a number of specimens of *P*. cf. *quaternaria* and compared them with illustrations and specimens of *P quaternaria* from southern England and Germany and images of *P reussi* from the upper *mucronata* Zone and Maastrichtian of Norfolk and Germany, there is little doubt that the species recorded here as P. cf. quaternaria is a separate species. Its more inflated, rather than slightly compressed, shape and the height and overlap of the apertural face, serves to distinguish it from *P. quaternaria sensu stricto*. The size and rounded shape of *P. reussi* separates it from both *P. quaternaria sensu stricto and P*. cf. *quaternaria*. The latter appears to be a new species.